CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
November 29, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 29, 2014 07:00 to November 30, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. AreaRAE Unit 02 detections for H_2S and LEL were confirmed as sensor drift by field personnel with handheld monitors. A new H_2S sensor was installed in this unit. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 29, 2014 07:00 – November 30, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	MR+ / MR Pro	26	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	26	0	NA	<1 %
	O_2	MR+ / MR Pro	26	26	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	26	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	25	25	0.02504	0.006 - 0.047 mg/m^3
	SO_2	MR+	26	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	27	0	NA	<0.2 mg/m3
	VOC	MR+ / MR Pro	26	0	NA	<0.1 ppm
Work Area	Cl_2	MR+ / MR Pro	15	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	15	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	6	0	NA	<1 %
	O_2	MR+ / MR Pro	1	1	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	SO_2	MR+	5	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	1	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	16	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
November 29, 2014 07:00 – November 30, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5588	184	0.1 ppm	0.1 - 0.2 ppm
	LEL	5588	0	NA	< 1 %
	SO_2	5588	0	NA	< 0.1 ppm
	VOC	5588	3	0.1 ppm	0.1 - 0.1 ppm
Unit 02	H_2S	5409	1003	0.1 ppm	0.1 - 5.2 ppm
	LEL	5409	7	2.90%	2.9 - 2.9 %
	SO_2	5409	2	0.1 ppm	0.1 - 0.1 ppm
	VOC	5409	1683	0.1 ppm	0.1 - 0.3 ppm
Unit 03	H_2S	5588	0	NA	< 1 ppm
	LEL	5588	0	NA	< 1 %
	SO_2	5588	0	NA	< 0.1 ppm
	VOC	5588	39	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H_2S	5601	231	0.1 ppm	0.1 - 0.2 ppm
	LEL	5601	0	NA	< 1 %
	SO_2	5601	0	NA	< 0.1 ppm
	VOC	5601	0	NA	< 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
November 29, 2014 07:00 – November 30, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10704069	AR01	2206	2206	0.025	0.006 - 0.213 mg/m^3
10704074	AR02	4585	4585	0.039	0.007 - 0.328 mg/m^3
10704072	AR03	4970	4970	0.036	0.003 - 2.789 mg/m^3
10408087	AR04	4145	3241	0.087	0.001 - 0.423 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

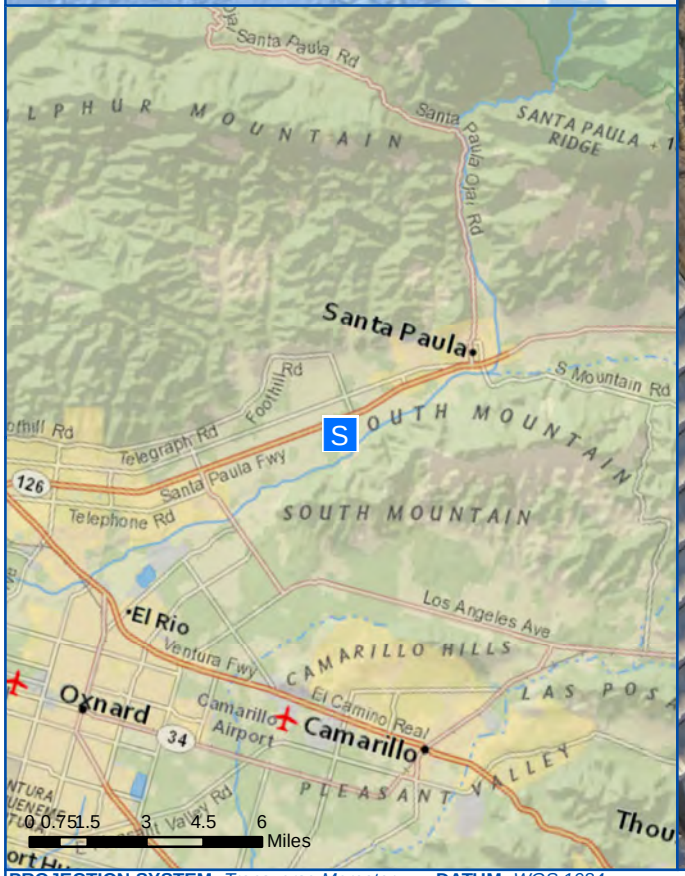
Incident Maps:

Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

Aerial Overview - 11/27/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/28/2014 12:07:39 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:49:00 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/30/2014 7:47:02 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/30/2014 7:34:59 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/30/2014 7:49:55 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:34:09 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:39:27 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:33:26 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:32:49 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Nov 29, 2014 07:00 to Nov 30, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/30/2014 7:47:50 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

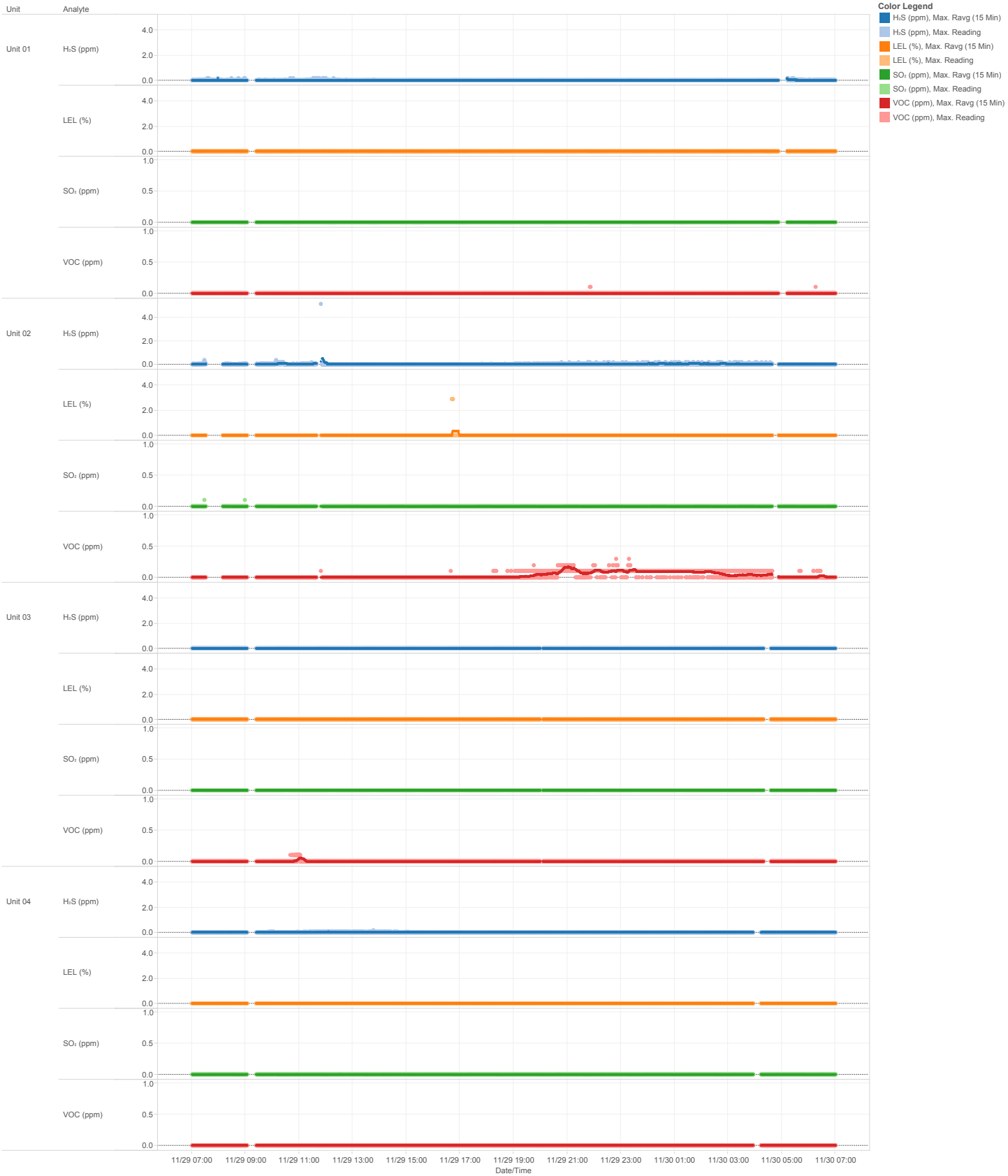
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

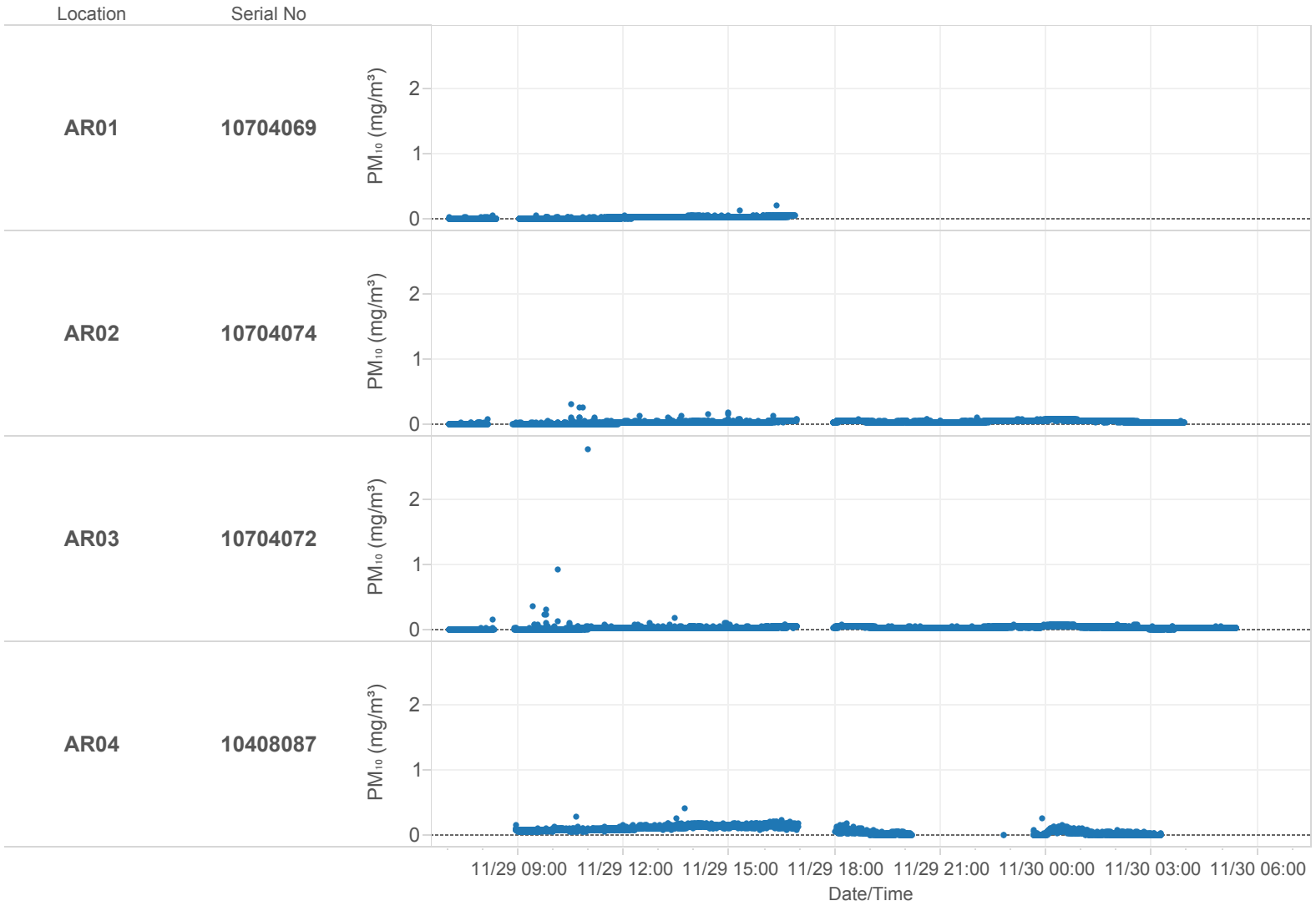
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

Patriot Environmental
AreaRAE Trend Graphs
11/29/2014 07:00 - 11/30/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
11/29/2014 07:00 - 11/30/2014 07:00



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